

# Improving the Capacity of Software Acquisition Management: An Alternative Methodology

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**ABSTRACT.** The acquisition of the information system technologies using the services of an external supplier could be the the best options to reduce the implementation and maintenance cost of software solutions, and allows a company to improve the efficient use of its resources. The focus of this paper is to outline a methodology structure for the software acquisition management. The methodology proposed in this paper is the result of the study and the convergence of the weakness and strengths of some models (CMMI, SA-CMM, ISO/IEC TR 15504, COBIT, and ITIL.) that include the software acquisition process.

**KEYWORDS:** Software acquisition management, software process improvement, outsourcing process.

## 1 Introduction

The subcontracting process is defined as the process of acquiring partially or totally the Information System (IS) technologies from an external services supplier [5]. It means to delegate everything or part of the IT work through a contract with an external company that joins in the client organizational strategy and seeks to design a solution to existing informatics problems inside the latter. From this point we must understand that a supplier is “the subcontracted entity” while a client is “the entity that subcontracts” Some companies have had good experiences subcontracting the payroll and accounting management, and they leave in professional hands these services obtaining important costs reductions. But, why if the companies have good results subcontracting those processes, they not apply their experiences to delegate IS services and processes to an external supplier? Nowadays, the principal disadvantages to subcontract the IS services are fundamentally the lack of guides for its implementation, the need to support a commitment in long term dedicating important resources, and the return of the investment (ROI) which supposes an unaffordable effort to support in these companies [7]. The elevated rhythm of technological innovation in IS does not allow many companies to be up-to-date, but they do not want to lose the technological train. Nevertheless, the activities of subcontracting IS are complex because the process is managed in an externally way in order to acquire products, systems and services, like internally to manage the own process. As a result, the identification of *effective prac-*

tices in the delegation of responsibilities of the software services and processes are focused on:

- Internally, to assure that the subcontracting process will be effective, and
- Externally, in order to the companies manage the subcontract process and takes the control of their suppliers.

This work focuses in the definition, design and implementation of a Software Acquisition Management Methodology (SAMM) and its objective is to implement an efficient software acquisition process, not only to mark the technological difference of a company with regard to their competitors, also because it facilitates the concentration of their own resources in the "core business" of the organization, which generates a bigger benefit without losing the aptitude to support their dedication to the client and search for new business [10]. Our approach assures that exist a fundamental process of acquisition that is defined, implemented, measured and maintained.

SAMM is the convergence of weakness and strengths of different process models based on the accomplishment or not of different specific criteria. The Table-1 shows the differences between SAMM and other process models.

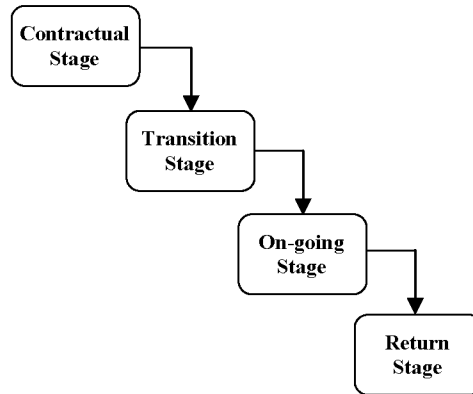
Criteria	Process Models						
	ISO 15504	CMMI	COBIT	SA-CMM	ITIL	IEEE 1062	SAMM
Procedures for Supplier Internal Management	✓	-	-	✓	-	✓	✓
Own Templates for Service Management	-	-	-	-	-	✓	✓
Establishment of Level Service Agreement	-	-	-	-	✓	-	✓
Incorporate the Process Continuous Improvement	✓	✓	-	✓	✓	-	✓
Metrics in Management	✓	✓	✓	✓	-	-	✓
Management requires a detailed contract	✓	✓	✓	✓	✓	✓	✓
Importance of Client-Supplier Friendship	✓	✓	-	✓	✓	✓	✓
Works in Small Settings	-	-	-	-	-	-	✓
Implementation High Costs	✓	✓	✓	✓	✓	✓	-

✓ Included - Not Included

Table 1. Differences between SAMM and other process models

## 1.1 Fundaments for the Software Acquisition Process

To achieve a successful acquisition process, it is necessary to perform linked and continuous actions. This set of actions needs inputs to produce outputs products and uses technologies and tools, drives to the definition of a specific methodology for the acquisition process to help us in the delegation of the IT functions of any company. Any acquisition process is based on four common life cycle stages (Figure 1) [1, 3, 6, 8]:



**Figure 1.** Common Stages of the Acquisition Process

- **Contractual Stage:** This stage begins with the service bid and ends with the contract signing. Its duration depends on the client and can be overlapped with next stages.
- **Transition Stage:** This is one of the most important methodology stages, the service team is in charge of acquiring the necessary knowledge from the installation and, at the same time, it would continue realizing their usual work because the service is considered as transferred since the first day. The transition stage would finish with a diffusion plan to all the team members and clients which makes official the restructuring that is performing during this stage. Also, the service team will establish the Service Level Agreement (SLA) that will govern the relations between supplier and client. Own activities of this stage are: *Definition of the transition plan, personnel transference, SLA definition, definition of mechanisms to follow-up and support, definition of procedures and establishment of development methodology.*
- **On going Stage:** This stage begins with the measurement period. The service is already stable, but during this period the SLA indicators defined in the previous stage are measured, and they are corrected if necessary. During this stage, the annual system plans and the mechanisms to follow-up and measure are defined before they are used.
- **Return Stage:** In this stage the service is ready for its transference to the client. All the time there would be realized its planning and previous associate works. In the case that the service remains with another supplier, it is time to finish the relation with the client and this phase would overlap with the transition phase of the new supplier.

On the other hand, it is well-known that every process of Software Acquisition Management is personalized for every client according to the characteristics demanded by him in function, among other aspects, of the scope of the service to be delivered, the application place of the mentioned service, the way service works, quality parameters, etc. In summary, any Software Acquisition process would be flexible,

stable and would provide high level of quality. The proposed methodology offers a high level of process management based on the efficient coordination of the three "P": people, processes and products.

## 2 Organization of the Software Acquisition Management Methodology

The adequate management of the acquisition process needs a set of elements that it is necessary to implement during the Transition Stage. These elements can be provided by both, the client or the supplier, however it is recommended the use of own means (of the providing company) to obtain homogeneous services. Figure 2 shows the general SAMM organization.

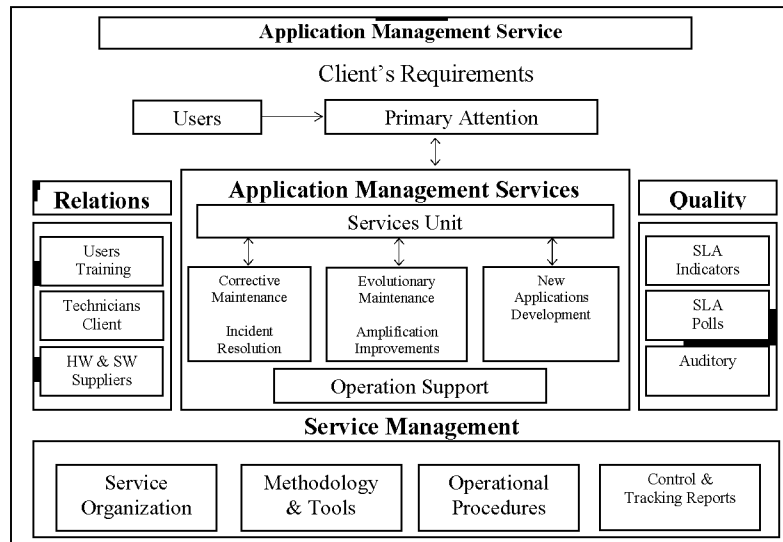


Figure 2. SAMM Organization

Briefly description of SAMM elements:

- **Primary Attention.** It is the communication channel for incidents and requests management between final users and the Services Unit. Commonly is identified as Help Desk.
- **Services Unit.** It is the set of technical personnel in charge of the service delivery. Among the developed activities are:
  - *Corrective Maintenance.* Activities for incidents and failures resolution produced in the software under operation.
  - *Evolutionary Maintenance.* Activities for the accomplishment of modifications and improvements in the software under operation.

- *New developments.* Activities for management and implementation of new software projects.
  - *Operational Support.* Activities for the resolution of specific or information management requests not structured as available functionality for the final user.
- **Relations.** These relations determine the responsibility matrix in the different activities to carry out during the service: *Users Training, Client Technical Personnel and HW and SW Suppliers.*
- **Quality.** The quality allows performing the objective or subjective evaluation of the performed services.
- **Service Organization.** It describes the terms and conditions of the agreement between client and supplier, by which the latter company will give the informatics services during the On-going Stage. The services scope and company responsibilities would be specified.
- **Methodology.** It systematically defines the way “to do the things” in the software life cycle.
  - *Support Tools.* The set of client tools and supplier management tools or a third part that can complement them.
- **Operational Procedures.** They define the operative flows among the different client areas and the service unit.
- **Control and Tracking Reports.** It is the set of generated reports to realize the service control and tracking.

## 2.1 SAMM Structure

The methodology helps to define the Software Acquisition Management process tasks, being identified the correct moment of its application and recognize and identify the inputs and outputs required by the process. This methodology begins when the supplier is in charge of the service and finishes when the contract finalizes. SAMM is a guide for the operative transference of the project and it focuses in those aspects detected as deficient and incomplete reducing the stages of the life cycle [4], [2], [5], [9] (Figure 1) from four to three (Figure 3).

Each stage of SAMM defines a set of effective practices that it is necessary to accomplish to continue with the next stage. Also SAMM provides a set of activities examples to help the companies to implement the methodology, and includes an expected list of work products for each stage (Figure 3). The SAMM stages are defined as it follows:

- **Initial Stage.** In this stage the SLA is established, and the time to expend for it is not less than one month and no more than three months, of course its depends on the scope and the complexity of the service to be subcontracted. The activities stages would be planned with the client, elaborating a Project Plan and the SLA. The sequence of the activities has to be neither "rigid" nor “sequential”, being possible to perform in parallel way.

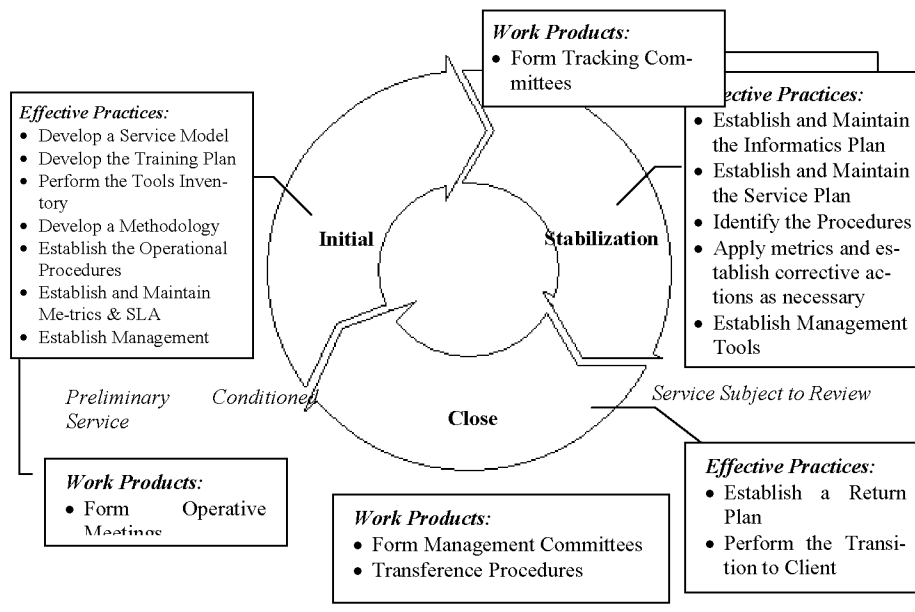


Figure 3. SAMM Stages and Effective Practices

- **Stabilization Stage.** The external supplier takes the control of the services previously defined in the SLA. The stage duration will be established in the contract (in years) and it will be particular for each client.
- **Closing Stage.** The objective of the stage is to prepare the conclusion of the service and perform the transference of the service to the client or a third part supplier. This stage covers the following aims:
  - To perform the activities of evolutionary and corrective maintenance and/or new developments, in such form that the SLA are not affected.
  - To plan the service transference defining the assumptions and conditions, and economic impact of the same.
  - To analyze the services to return from the point of view of their resources complexity, significance and availability.
  - To develop a training plan oriented to the personnel that will assume the continuity of the maintenance.
  - To transfer existing knowledge in documents, records ....
  - To transfer sources, libraries, supports and services.

### 3 Conclusions and Future Research

The Information System subcontracting is increasingly spreading in more companies as a solution to implement and maintenance software applications. However, now the most important decision of the companies consists of choosing to the supplier that

will be its technological partner. In this difficult decision, companies looking for low costs and good references, but also they pay attention in the solid experience of its partner to confront this new challenge.

The proposed methodology summarize this experience in a document that allows the external supplier be in charge of the service with total guarantee, giving the adequate steps in the right moments. Also this methodology is a helpful instrument to manage the software acquisition process because provides templates; examples and procedure that it would be apply order to give the service.

The future research lines establish relations and coexistence of the methodology with other process that are directly related with the Software Acquisition Management such as: Project Management, Requirements Analysis & Elicitation, Software Reutilization, Change Control, Documentation, Testing and Code Maintenance.

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